

R309-205. Source Monitoring Requirements (Effective December 9, 2002)

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R309-205-1. Purpose.

The purpose of this rule is to outline the monitoring requirements for public water systems with regard to their water sources.

R309-205-2. Authority.

This rule is promulgated by the Drinking Water Board as authorized by Title 19, Environmental Quality Code, Chapter 4, Safe Drinking Water Act, Subsection 104 of the Utah Code and in accordance with 63-46a of the same, known as the Administrative Rulemaking Act.

R309-205-3. Definitions.

Definitions for certain terms used in this rule are given in R309-110 but may be further clarified herein.

R309-205-4. General.

- (1) All public water systems are required to monitor their water to determine if they comply with the requirements for water quality stated in R309-200. In exceptional circumstances the Executive Secretary may modify the monitoring requirements given herein as is deemed appropriate.
- (2) The Executive Secretary may determine compliance or initiate compliance actions based upon analytical results and other information compiled by authorized representatives.
- (3) If the water fails to meet minimum standards, then certain public notification procedures shall be carried out, as outlined in R309-220. Water suppliers shall also keep analytical records in their possession, for a required length of time, as outlined in R309-105-17.
- (4) All samples shall be taken at each source or point of entry to the distribution system as specified herein for each contaminant or group of contaminants.
- (5) For the purpose of determining compliance, samples may only be considered if they have been analyzed by the State of Utah primacy laboratory or a laboratory certified by the Utah State Health Laboratory.

(6) Measurements for pH, temperature, turbidity and disinfectant residual may, under the direction of the direct responsible operator, be performed by any water supplier or their representative.

(7) All samples shall be marked either: routine, repeat, check or investigative before submission of such samples to a certified laboratory. Routine, repeat, and check samples shall be considered compliance purpose samples.

(8) All sample results can be sent to the Division of Drinking Water either electronically or in hard copy form.

(9) Unless otherwise required by the Board, the effective dates on which required monitoring shall be initiated are identical to the dates published in 40 CFR 141 on July 1, 2001 by the Office of the Federal Register.

(10) Exemptions from monitoring requirements shall only be granted in accordance with R309-105-5.

R309-205-5. Inorganic Contaminants.

Community, non-transient non-community, and transient non-community water systems shall conduct monitoring as specified to determine compliance with the maximum contaminant levels specified in R309-200-5 in accordance with this section.

(1) Monitoring shall be conducted as follows:

(a) Groundwater systems shall take a minimum of one sample at every entry point to the distribution system which is representative of each well after treatment (hereafter called a sampling point) beginning in the compliance period starting January 1, 1993. The system shall take each sample at the same sampling point unless conditions make another sampling point more representative of each source or treatment plant.

(b) Surface water systems shall take a minimum of one sample at every entry point to the distribution system after any application of treatment or in the distribution system at a point which is representative of each source after treatment (hereafter called a sampling point) beginning in the compliance period beginning January 1, 1993. The system shall take each sample at the same sampling point unless conditions make another sampling point more representative of each source or treatment plant. (Note: For purposes of this paragraph, surface water systems include systems with a combination of surface and ground sources.)

(c) If a system draws water from more than one source and the sources are combined before distribution, the system shall sample at an entry point to the distribution system during periods of normal operating conditions (i.e., when water is representative of all sources being used).

(d) The frequency of monitoring for asbestos shall be in accordance with R309-205-5(2); the frequency of monitoring for antimony, arsenic, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, nickel, selenium, sodium, sulfate, thallium, and total dissolved solids shall be in accordance with R309-205-5(3); the frequency of monitoring for nitrate shall be in accordance with R309-205-5(4); the frequency of monitoring for nitrite shall be in accordance with R309-205-5(5).

(e) Confirmation samples:

(i) Where the results of sampling for antimony, arsenic, asbestos, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, nickel, selenium, sulfate, thallium or total dissolved solids indicate an exceedance of the maximum contaminant level, the Executive Secretary may require that one additional sample be collected as soon as possible after the initial sample was taken (but not to exceed two weeks) at the same sampling point.

(ii) Where nitrate or nitrite sampling results indicate an exceedance of the maximum contaminant level, the system shall take a confirmation sample within 24 hours of the system's receipt of notification of the analytical results of the first sample. Systems unable to comply with the 24-hour sampling requirement shall immediately notify the consumers in the area served by the public water system source in accordance with R309-220-5. Systems exercising this option shall take and analyze a confirmation sample within two weeks of notification of the analytical results of the first sample.

(iii) Procedures if the Secondary Standard for Fluoride is Exceeded
Notification of State and/or Public.

If the result of an analysis indicates that the level of fluoride exceeds the Secondary Drinking Water Standard, the supplier of water shall give notice as required in R309-220-11.

(iv) The results of the initial and confirmation sample(s) taken for any contaminant, shall be averaged. The resulting average shall be used to determine the system's compliance in accordance with paragraph (1)(g) of this section. The Executive Secretary has the discretion to delete results of obvious sampling errors.

(f) The Executive Secretary may require more frequent monitoring than specified in paragraphs (2), (3), (4) and (5) of this section or may require confirmation samples for positive and negative results. The Executive Secretary may also require an appropriate treatment process.

(g) Compliance with R309-200-5(1) shall be determined based on the analytical result(s) obtained at each sampling point.

(i) For systems which are conducting monitoring at a frequency greater than annual, compliance with the maximum contaminant levels for antimony, arsenic, asbestos, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, nickel, selenium, sulfate, thallium and total dissolved solids is determined by a running annual average at each sampling point. If the average at any sampling point is greater than the MCL, then the system is out of compliance. If any one sample would cause the annual average to be exceeded, then the system is out of compliance immediately. Any sample below the detection limit shall be calculated at zero for the purpose of determining the annual average.

(ii) For systems which are monitoring annually, or less frequently, the system is out of compliance with the maximum contaminant levels for antimony, arsenic, asbestos, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, nickel, selenium, sulfate, thallium and total dissolved solids if the level of a contaminant at any sampling point is greater than the MCL. If a confirmation sample is required by the Executive Secretary, the determination of compliance will be based on the average of the two samples. If the average of the samples exceed the maximum contaminant levels then the water system shall provide public notice as required under R309-220.

(iii) Compliance with the maximum contaminant levels for nitrate and nitrite is determined based on one sample. If the levels of nitrate and/or nitrite exceed the MCLs in the initial sample, a confirmation sample is required in accordance with paragraph (1)(g)(ii) of this section, and compliance shall be determined based on the average of the initial and confirmation samples.

(iv) If a public water system has a distribution system separable from other parts of the distribution system with no interconnections, the Executive Secretary may allow the system to give public notice to only the area served by that portion of the system which is out of compliance.

(h) Each public water system shall monitor at the time designated by the Executive Secretary during each compliance period.

(2) The frequency of monitoring conducted to determine compliance with the maximum contaminant level for asbestos specified in R309-200-5(1) shall be conducted as follows:

(a) Each community and non-transient non-community water system is required to monitor for asbestos during the first three-year compliance period of each nine-year compliance cycle beginning in the compliance period starting January 1, 1993.

(b) If the system believes it is not vulnerable to asbestos contamination in its source water, it may apply to the Executive Secretary for a waiver of the monitoring requirement in paragraph (a) of this section. If the Executive Secretary grants the waiver, the system is not required to monitor for asbestos.

(c) The Executive Secretary may grant a waiver based on a consideration of the potential asbestos contamination of the water source.

(d) A waiver remains in effect until the completion of the three-year compliance period. Systems not receiving a waiver shall monitor in accordance with the provisions of paragraph (a) of this section.

(e) A system vulnerable to asbestos contamination due solely to source water shall monitor in accordance with the provision of R309-205-5(1).

(f) A system vulnerable to asbestos contamination due both to its source water supply and corrosion of asbestos-cement pipe as specified in R309-210-7 shall take one sample at a tap served by asbestos-cement pipe and under conditions where asbestos contamination is most likely to occur.

(g) A system which exceeds the maximum contaminant levels as determined in R309-205-5(1)(g) shall monitor quarterly beginning in the next quarter after the violation occurred.

(h) The Executive Secretary may decrease the quarterly monitoring requirement to the frequency specified in paragraph (a) of this section provided the Executive Secretary has determined that the system is reliably and consistently below the maximum contaminant level. In no case can the Executive Secretary make this determination unless a groundwater system takes a minimum of two quarterly samples and a surface (or combined surface/ground) water system takes a minimum of four quarterly samples.

(i) If monitoring data collected after January 1, 1990 are generally consistent with the requirements of R309-205-5(2), then the Executive Secretary may allow systems to use that data to satisfy the monitoring requirement for the initial compliance period beginning January 1, 1993.

(3) The frequency of monitoring conducted to determine compliance with the maximum contaminant levels in R309-200-5(1). for antimony, arsenic, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, nickel, selenium, sodium, sulfate, thallium and total dissolved solids shall be as follows:

(a) Each community and non-transient non-community groundwater system shall take one sample at each sampling point once every three years. Each community and non-transient non-community surface water system (or combined surface/ground) shall take one sample annually at each sampling point. Each transient non-community system shall take one sample for sulfate only at each sampling point once every three years for both groundwater and surface water systems.

(b) The system may apply to the Executive Secretary for a waiver from the monitoring frequencies specified in paragraph (3)(a) of this section. A waiver from the monitoring requirements for arsenic shall not be available.

(c) A condition of the waiver shall require that a system shall take a minimum of one sample while the waiver is effective. The term during which the waiver is effective shall not exceed one compliance cycle (i.e., nine years).

(d) The Executive Secretary may grant a waiver provided surface water systems have monitored annually for at least three years and groundwater systems have conducted a minimum of three rounds of monitoring. (At least one sample shall have been taken since January 1, 1990.) Both surface and groundwater systems shall demonstrate that all previous analytical results were less than the maximum contaminant level. Systems that use a new water source are not eligible for a waiver until three rounds of monitoring from the new source have been completed.

(e) In determining the appropriate reduced monitoring frequency, the Executive Secretary shall consider:

(i) Reported concentrations from all previous monitoring;

(ii) The degree of variation in reported concentrations; and

(iii) Other factors which may affect contaminant concentrations such as changes in groundwater pumping rates, changes in the system's configuration, changes in the system's operating procedures, or changes in stream flows or characteristics.

(f) A decision by the Executive Secretary to grant a waiver shall be made in writing and shall set forth the basis for the determination. The determination may be initiated by the Executive Secretary or upon an application by the public water system. The public water system shall specify the basis for its request. The

Executive Secretary shall review and, where appropriate, revise its determination of the appropriate monitoring frequency when the system submits new monitoring data or when other data relevant to the system's appropriate monitoring frequency become available.

(g) Systems which exceed the maximum contaminant levels as calculated in R309-205-5(1)(g) of this section shall monitor quarterly beginning in the next quarter after the violation occurred.

(h) The Executive Secretary may decrease the quarterly monitoring requirement to the frequencies specified in paragraphs (3)(a) and (b) of this section provided it has determined that the system is reliably and consistently below the maximum contaminant level. In no case can the Executive Secretary make this determination unless a groundwater system takes a minimum of two quarterly samples and a surface water system takes a minimum of four quarterly samples.

(4) All public water systems (community; non-transient non-community; and transient non-community systems) shall monitor to determine compliance with the maximum contaminant level for nitrate in R309-200-5(1).

(a) Community and non-transient non-community water systems served by groundwater systems shall monitor annually beginning January 1, 1993; systems served by surface water shall monitor quarterly beginning January 1, 1993.

(b) For community and non-transient non-community water systems, the repeat monitoring frequency for ground water systems shall be quarterly for at least one year following any one sample in which the concentration is greater than or equal to 50 percent of the MCL. The Executive Secretary may allow a groundwater system to reduce the sampling frequency to annually after four consecutive quarterly samples are reliably and consistently less than the MCL.

(c) For community and non-transient non-community water systems, the Executive Secretary may allow a surface water system to reduce the sampling frequency to annually if all analytical results from four consecutive quarters are less than 50 percent of the MCL. A surface water system shall return to quarterly monitoring if any one sample is greater than or equal to 50 percent of the MCL.

(d) Each transient non-community water system shall monitor annually beginning January 1, 1993.

(e) After the initial round of quarterly sampling is completed, each community and non-transient non-community system which is monitoring annually shall take subsequent samples during the quarter(s) which previously resulted in the highest analytical result.

(5) All public water systems (community; non-transient non-community; and transient non-community systems) shall monitor to determine compliance with the maximum contaminant level for nitrite in R309-200-5(1).

(a) All public water systems shall take one sample at each sampling point in the compliance period beginning January 1, 1993 and ending December 31, 1995.

(b) After the initial sample, systems where an analytical result for nitrite is less than 50 percent of the MCL shall monitor at the frequency specified by the Executive Secretary.

(c) For community, non-transient non-community, and transient non-community water systems, the repeat monitoring frequency for any water system shall be quarterly for at least one year following any one sample in which the concentration is greater than or equal to 50 percent of the MCL. The Executive Secretary may allow a system to reduce the sampling frequency to annually after determining the system is reliably and consistently less than the MCL.

(d) Systems which are monitoring annually shall take each subsequent sample during the quarter(s) which previously resulted in the highest analytical result.

R309-205-6. Organic Contaminants.

For the purposes of R309-100 through R309-605, organic chemicals are divided into three categories: Pesticides/PCBs/SOCs, volatile organic contaminants (VOCs) and total trihalomethanes.

(1) Pesticides/PCBs/SOCs monitoring requirements.

Analysis of the contaminants listed in R309-200-5(2)(a) for the purposes of determining compliance with the maximum contaminant level shall be conducted as follows:

(a) Groundwater systems shall take a minimum of one sample at every entry point to the distribution system which is representative of each well after treatment (hereafter called a sampling point). Each sample shall be taken at the same sampling point unless conditions make another sampling point more representative of each source or treatment plant.

(b) Surface water systems shall take a minimum of one sample at points in the distribution system that are representative of each source or at each entry point to the distribution system after treatment (hereafter called a sampling point). Each sample shall be taken at the same sampling point unless conditions make another sampling point more representative of each source or treatment plant. (Note: For

purposes of this paragraph, surface water systems include systems with a combination of surface and ground sources.)

(c) If the system draws water from more than one source and the sources are combined before distribution, the system shall sample at an entry point to the distribution system during periods of normal operating conditions (i.e., when water representative of all sources is being used).

(d) Monitoring frequency:

(i) Each community and non-transient non-community water system shall take four consecutive quarterly samples for each contaminant listed in R309-200-5(2)(a) during each compliance period beginning with the compliance period starting January 1, 1993. For systems serving less than 3,300, this requirement may be reduced to one sample if the sample is taken prior to October 1, 1993.

(ii) Systems serving more than 3,300 persons which do not detect a contaminant in the initial compliance period, may reduce the sampling frequency to a minimum of two quarterly samples in one year during each repeat compliance period.

(iii) Systems serving less than or equal to 3,300 persons which do not detect a contaminant in the initial compliance period may reduce the sampling frequency to a minimum of one sample during each repeat compliance period.

(e) Each community and non-transient non-community water system may apply to the Executive Secretary for a waiver from the requirement of paragraph (d) of this section. A system shall reapply for a waiver for each compliance period.

(f) The Executive Secretary may grant: a use waiver, a susceptibility waiver or a reliably and consistently waiver. The use and susceptibility waivers shall be granted in accordance with R309-600-16. The reliably and consistently waiver shall be based on a minimum of three rounds of monitoring where the results of analysis for all constituents show that no contaminant is detected, or that the detected amount of a contaminant is less than half the MCL.

(i) If a use waiver is granted no monitoring for pesticides/PCBs/SOCs will be required, provided documentation consistent with R309-600-16 and justifying the continuance of a use waiver is submitted to the Executive Secretary at least every six years.

(ii) If a susceptibility waiver or a reliably and consistently waiver is granted, monitoring for pesticides/PCBs/SOCs shall be preformed as listed below, provided documentation consistent with R309-600-16 and

justifying the continuance of a susceptibility waiver is submitted to the Executive Secretary at least every six years or in the case of a reliably and consistently waiver that the analytical results justify the continuance of the reliably and consistently waiver.

(A) For community and non-transient non community systems serving populations greater than 3,300 people, samples for pesticides/PCBs/SOCs shall be taken in two consecutive quarters every three years.

(B) For community and non-transient non community systems serving populations less than 3,301 people, samples for pesticides/PCBs/SOCs shall be taken every three years.

(g) If an organic contaminant listed in R309-200-5(2)(a) is detected in any sample, then:

(i) Each system shall monitor quarterly at each sampling point which resulted in a detection.

(ii) The Executive Secretary may decrease the quarterly monitoring requirement specified in paragraph (g)(i) of this section provided it has determined that the system is reliably and consistently below the maximum contaminant level. In no case shall the Executive Secretary make this determination unless a groundwater system takes a minimum of two quarterly samples and a surface water system takes a minimum of four quarterly samples.

(iii) After the Executive Secretary determines the system is reliably and consistently below the maximum contaminant level the Executive Secretary may allow the system to monitor annually. Systems which monitor annually shall monitor during the quarter that previously yielded the highest analytical result.

(iv) Systems which have 3 consecutive annual samples with no detection of a contaminant may apply to the Executive Secretary for a waiver as specified in paragraph (f) of this section.

(v) If monitoring results in detection of one or more of certain related contaminants (aldicarb, aldicarb sulfone, aldicarb sulfoxide and heptachlor, heptachlor epoxide), then subsequent monitoring shall analyze for all related contaminants.

(h) Systems which violate the maximum contaminant levels of R309-200-5(2)(a) as determined by paragraph (j) of this section shall monitor quarterly. After a minimum of four quarterly samples show the system is in compliance and the

Executive Secretary determines the system is reliably and consistently below the MCL, as specified in paragraph (j) of this section, the system shall monitor at the frequency specified in paragraph (g)(iii) of this section.

(i) The Executive Secretary may require a confirmation sample for positive or negative results. If a confirmation sample is required by the Executive Secretary, the result shall be averaged with the first sampling result and the average used for the compliance determination as specified by paragraph (j) of this section. The Executive Secretary has the discretion to delete results of obvious sampling errors from this calculation.

(j) Compliance with the maximum contaminant levels in R309-200-5(2)(a) shall be determined based on the analytical results obtained at each sampling point.

(i) For systems which are conducting monitoring at a frequency greater than annual, compliance is determined by a running annual average of all samples taken at each sampling point. If the annual average of any sampling point is greater than the MCL, then the system is out of compliance. If the initial sample or a subsequent sample would cause the annual average to be exceeded, then the system is out of compliance immediately. Any samples below the detection limit shall be calculated as zero for purposes of determining the annual average.

(ii) If monitoring is conducted annually, or less frequently, the system is out of compliance if the level of a contaminant at any sampling point is greater than the MCL. If a confirmation sample is required by the Executive Secretary, the determination of compliance will be based on the average of two samples.

(iii) If a public water system has a distribution system separable from other parts of the distribution system with no interconnections, the Executive Secretary may allow the system to give public notice to only that portion of the system which is out of compliance.

(k) If monitoring data collected after January 1, 1990, are generally consistent with the other requirements of this section, then the Executive Secretary may allow systems to use that data to satisfy the monitoring requirement for the initial compliance period beginning January 1, 1993.

(l) The Executive Secretary may increase the required monitoring frequency, where necessary, to detect variations within the system (e.g., fluctuations in concentration due to seasonal use, changes in water source).

(m) The Executive Secretary has the authority to determine compliance or initiate enforcement action based upon analytical results and other information compiled by their sanctioned representatives and agencies.

(n) Each public water system shall monitor at the time designated by the Executive Secretary within each compliance period.

(2) Volatile organic contaminants monitoring requirements.

Analysis of the contaminants listed in R309-200-5(2)(b) for the purpose of determining compliance with the maximum contaminant level shall be conducted as follows:

(a) Groundwater systems shall take a minimum of one sample at every entry point to the distribution system which is representative of each well after treatment (hereafter called a sampling point). Each sample shall be taken at the same sampling point unless conditions make another sampling point more representative of each source, treatment plant or within the distribution system.

(b) Surface water systems (or combined surface/ground) shall take a minimum of one sample at points in the distribution system that are representative of each source or at each entry point to the distribution system after treatment (hereafter called a sampling point). Each sample shall be taken at the same sampling point unless conditions make another sampling point more representative of each source, treatment plant, or within the distribution system.

(c) If the system draws water from more than one source and the sources are combined before distribution, the system shall sample at an entry point to the distribution system during periods of normal operating conditions (i.e., when water representative of all sources is being used).

(d) Each community and non-transient non-community water system shall initially take four consecutive quarterly samples for each contaminant listed in R309-200-5(2)(b), Table 200-3, numbers 2 through 21 during each compliance period beginning in the initial compliance period. For systems serving a population of less than 3,300, this requirement may be reduced to one sample if the sample is taken prior to October 1, 1993.

(e) If the initial monitoring for contaminants listed in R309-200-5(2)(b), Table 200-3, numbers 2 through 21 as allowed in paragraph (n) has been completed by December 31, 1992, and the system did not detect any contaminant listed in R309-200-5(2)(b), then each ground and surface water system shall take one sample annually beginning with the initial compliance period.

(f) After a minimum of three years of annual sampling, the Executive Secretary may allow groundwater systems with no previous detection of any contaminant listed in R309-200-5(2)(b) to take one sample during each compliance period.

(g) Each community and non-transient non-community water system which does not detect a contaminant listed in R309-200-5(2)(b) may apply to the Executive Secretary for a waiver from the requirements of paragraph (d) and (e) of this section after completing the initial monitoring. (For the purposes of this section, detection is defined as greater than or equal to 0.0005 mg/L.) A waiver shall be effective for no more than six years (two compliance periods). The Executive Secretary may also issue waivers for the initial round of monitoring for 1,2,4-trichlorobenzene.

(h) The Executive Secretary may grant: a use waiver, a susceptibility waiver or a reliably and consistently waiver. The use and susceptibility waivers shall be granted in accordance with R309-600-16. The reliably and consistently waiver shall be based on a minimum of three rounds of monitoring where the results of analysis for all constituents show that no contaminant is detected, or that the detected amount of a contaminant is less than half the MCL. To maintain a use waiver or a susceptibility waiver a system shall submit documentation consistent with R309-600-16 which justifies the continuance of a use or a susceptibility waiver at least every six years. For a reliably and consistently waiver, the analytical results for all constituents of all samples shall justify its continuance. If a waiver is granted, monitoring for VOCs will be required at least every six years.

(i) As a condition of the waiver a groundwater system shall take one sample at each sampling point during the time the waiver is effective (i.e., one sample during two compliance periods or six years) and update its source protection plan in accordance with R309-600.

(j) If a contaminant listed in R309-200-5(2)(b), Table 200-3, numbers 2 through 21 is detected at a level exceeding 0.0005 mg/L in any sample, then:

(i) The system shall monitor quarterly at each sampling point which resulted in a detection.

(ii) The Executive Secretary may decrease the quarterly monitoring requirement specified in paragraph (j)(i) of this section provided it has determined that the system is reliably and consistently below the maximum contaminant level. In no case shall the Executive Secretary make this determination unless a groundwater system takes a minimum of two quarterly samples and a surface water system takes a minimum of four quarterly samples.

(iii) If the Executive Secretary determines that the system is reliably and consistently below the MCL, the Executive Secretary may allow the system to monitor annually. Systems which monitor annually shall monitor during the quarter(s) which previously yielded the highest analytical result.

(iv) Systems which have three consecutive annual samples with no detection of a contaminant may apply to the Executive Secretary for a waiver as specified in paragraph (f) of this section.

(v) Groundwater systems which have detected one or more of the following two-carbon organic compounds: trichloroethylene, tetrachloroethylene, 1,2-dichloroethane, 1,1,1-trichloroethane, cis-1,2-dichloroethylene, trans-1,2-dichloroethylene, or 1,1-dichloroethylene shall monitor quarterly for vinyl chloride. A vinyl chloride sample shall be taken at each sampling point at which one or more of the two-carbon organic compounds were detected. If the results of the first analysis do not detect vinyl chloride, the Executive Secretary may reduce the quarterly monitoring frequency of vinyl chloride monitoring to one sample during each compliance period. Surface water systems are required to monitor for vinyl chloride as specified by the Executive Secretary.

(k) Systems which violate the maximum contaminant levels as required in R309-200-5(2)(b) as determined by paragraph (m) of this section shall monitor quarterly. After a minimum of four consecutive quarterly samples shows the system is in compliance as specified in paragraph (m) of this section, and the Executive Secretary determines that the system is reliably and consistently below the maximum contaminant level, the system may monitor at the frequency and time specified in paragraph (j)(iii) of this section.

(l) The Executive Secretary may require a confirmation sample for positive or negative results. If a confirmation sample is required by the Executive Secretary, the result shall be averaged with the first sampling result and the average is used for the compliance determination as specified by paragraph (m) of this section. The Executive Secretary has the discretion to delete results of obvious sampling errors from this calculation.

(m) Compliance with R309-200-5(2)(b) shall be determined based on the analytical results obtained at each sampling point.

(i) For systems which are conducting monitoring at a frequency greater than annual, compliance is determined by a running annual average of all samples taken at each sampling point. If the annual average of any sampling point is greater than the MCL, then the system is out of compliance. If the initial sample or a subsequent sample would cause the annual average to be exceeded, then the system is out of compliance immediately. Any samples below the detection limit shall be calculated as zero for purposes of determining the annual average.

(ii) If monitoring is conducted annually, or less frequently, the system is out of compliance if the level of a contaminant at any sampling point is greater than the MCL. If a confirmation sample is required by the

Executive Secretary, the determination of compliance will be based on the average of two samples.

(iii) If a public water system has a distribution system separable from other parts of the distribution system with no interconnections, the Executive Secretary may allow the system to give public notice to only that area served by that portion of the system which is out of compliance.

(n) The Executive Secretary may allow the use of monitoring data collected after January 1, 1988 for purposes of monitoring compliance providing that the data is generally consistent with the other requirements in this section, the Executive Secretary may use that data (i.e., a single sample rather than four quarterly samples) to satisfy the initial monitoring requirement of paragraph (d) of this section. Systems which use grandfathered samples and did not detect any contaminant listed in R309-200-5(2)(b) shall begin monitoring annually in accordance with (e) of this section.

(o) The Executive Secretary may increase required monitoring where necessary to detect variations within the system.

(p) Each public water system shall monitor at the time designated by the Executive Secretary within each compliance period.

R309-205-7. Radiological Contaminants.

(1) Monitoring and compliance requirements for gross alpha particle activity, radium-226, radium-228, and uranium.

(a) Community water systems (CWSs) shall conduct initial monitoring to determine compliance with R309-200-5(4)(b), (c), and (e) by December 31, 2007. For the purposes of monitoring for gross alpha particle activity, radium-226, radium-228, uranium, and beta particle and photon radioactivity in drinking water, the following detection limits are established: Gross alpha particle activity - 3 pCi/L, Radium 226 - 1 pCi/L, Radium 228 - 1 pCi/L, and Uranium - reserved.

(i) Applicability and sampling location for existing community water systems or sources. All existing CWSs using ground water, surface water or systems using both ground and surface water (for the purpose of this section hereafter referred to as systems) shall sample at every entry point to the distribution system that is representative of all sources being used (hereafter called a sampling point) under normal operating conditions. The system shall take each sample at the same sampling point unless conditions make another sampling point more representative of each

source or the Executive Secretary has designated a distribution system location, in accordance with paragraph (1)(b)(ii)(C) of this section.

(ii) Applicability and sampling location for new community water systems or sources. All new CWSs or CWSs that use a new source of water shall begin to conduct initial monitoring for the new source within the first quarter after initiating use of the source. CWSs shall conduct more frequent monitoring when ordered by the Executive Secretary in the event of possible contamination or when changes in the distribution system or treatment processes occur which may increase the concentration of radioactivity in finished water.

(b) Initial monitoring: Systems shall conduct initial monitoring for gross alpha particle activity, radium-226, radium-228, and uranium as follows:

(i) Systems without acceptable historical data, as defined below, shall collect four consecutive quarterly samples at all sampling points before December 31, 2007.

(ii) Grandfathering of data: The Executive Secretary may allow historical monitoring data collected at a sampling point to satisfy the initial monitoring requirements for that sampling point, for the following situations.

(A) To satisfy initial monitoring requirements, a community water system having only one entry point to the distribution system may use the monitoring data from the last compliance monitoring period that began between June 2000 and December 8, 2003.

(B) To satisfy initial monitoring requirements, a community water system with multiple entry points and having appropriate historical monitoring data for each entry point to the distribution system may use the monitoring data from the last compliance monitoring period that began between June 2000 and December 8, 2003.

(C) To satisfy initial monitoring requirements, a community water system with appropriate historical data for a representative point in the distribution system may use the monitoring data from the last compliance monitoring period that began between June 2000 and December 8, 2003, provided that the Executive Secretary finds that the historical data satisfactorily demonstrate that each entry point to the distribution system is expected to be in compliance based upon the historical data and reasonable assumptions about the variability of contaminant levels between

entry points. The Executive Secretary shall make a written finding indicating how the data conforms to these requirements.

(iii) For gross alpha particle activity, uranium, radium-226, and radium-228 monitoring, the Executive Secretary may waive the final two quarters of initial monitoring for a sampling point if the results of the samples from the previous two quarters are below the detection limit.

(iv) If the average of the initial monitoring results for a sampling point is above the MCL, the system shall collect and analyze quarterly samples at that sampling point until the system has results from four consecutive quarters that are at or below the MCL, unless the system enters into another schedule as part of a formal compliance agreement with the Executive Secretary.

(c) Reduced monitoring: The Executive Secretary may allow community water systems to reduce the future frequency of monitoring from once every three years to once every six or nine years at each sampling point, based on the following criteria.

(i) If the average of the initial monitoring results for each contaminant (*i.e.*, gross alpha particle activity, uranium, radium-226, or radium-228) is below the detection limit specified in paragraph (1)(a) of this section, the system shall collect and analyze for that contaminant using at least one sample at that sampling point every nine years.

(ii) For gross alpha particle activity and uranium, if the average of the initial monitoring results for each contaminant is at or above the detection limit but at or below 1/2 the MCL, the system shall collect and analyze for that contaminant using at least one sample at that sampling point every six years. For combined radium-226 and radium-228, the analytical results shall be combined. If the average of the combined initial monitoring results for radium-226 and radium-228 is at or above the detection limit but at or below 1/2 the MCL, the system shall collect and analyze for that contaminant using at least one sample at that sampling point every six years.

(iii) For gross alpha particle activity and uranium, if the average of the initial monitoring results for each contaminant is above 1/2 the MCL but at or below the MCL, the system shall collect and analyze at least one sample at that sampling point every three years. For combined radium-226 and radium-228, the analytical results shall be combined. If the average of the combined initial monitoring results for radium-226 and radium-228 is above 1/2 the MCL but at or below the MCL, the system shall collect and analyze at least one sample at that sampling point every three years.

(iv) Systems shall use the samples collected during the reduced monitoring period to determine the monitoring frequency for subsequent monitoring periods (*e.g.*, if a system's sampling point is on a nine year monitoring period, and the sample result is above 1/2 MCL, then the next monitoring period for that sampling point is three years).

(v) If a system has a monitoring result that exceeds the MCL while on reduced monitoring, the system shall collect and analyze quarterly samples at that sampling point until the system has results from four consecutive quarters that are below the MCL, unless the system enters into another schedule as part of a formal compliance agreement with the Executive Secretary.

(d) Compositing: To fulfill quarterly monitoring requirements for gross alpha particle activity, radium-226, radium-228, or uranium, a system may composite up to four consecutive quarterly samples from a single entry point if analysis is done within a year of the first sample. The Executive Secretary will treat analytical results from the composited as the average analytical result to determine compliance with the MCLs and the future monitoring frequency. If the analytical result from the composited sample is greater than 1/2 MCL, the Executive Secretary may direct the system to take additional quarterly samples before allowing the system to sample under a reduced monitoring schedule.

(e) A gross alpha particle activity measurement may be substituted for the required radium-226 measurement provided that the measured gross alpha particle activity does not exceed 5 pCi/l. A gross alpha particle activity measurement may be substituted for the required uranium measurement provided that the measured gross alpha particle activity does not exceed 15 pCi/l.

(f) The gross alpha measurement shall have a confidence interval of 95% ($1.65s$, where s is the standard deviation of the net counting rate of the sample) for radium-226 and uranium. When a system uses a gross alpha particle activity measurement in lieu of a radium-226 and/or uranium measurement, the gross alpha particle activity analytical result will be used to determine the future monitoring frequency for radium-226 and/or uranium. If the gross alpha particle activity result is less than detection, 1/2 the detection limit will be used to determine compliance and the future monitoring frequency.

(2) Monitoring and compliance requirements for beta particle and photon radioactivity.

To determine compliance with the maximum contaminant levels in R309-200-5(4)(d) for beta particle and photon radioactivity, a system shall monitor at a frequency as follows:

(a) Community water systems (both surface and ground water) designated by the Executive Secretary as vulnerable shall sample for beta particle and photon radioactivity. Systems shall collect quarterly samples for beta emitters and annual samples for tritium and strontium-90 at each entry point to the distribution system (hereafter called a sampling point), beginning within one quarter after being notified by the Executive Secretary. Systems already designated by the Executive Secretary shall continue to sample until the Executive Secretary reviews and either reaffirms or removes the designation. The following detection limits are established: Tritium - 1,000 pCi/l; Strontium-89 - 10 pCi/l; Strontium-90 - 2 pCi/l; Iodine-131 - 1 pCi/l; Cesium-134 - 10 pCi/l; Gross beta - 4 pCi/l; and other radionuclides (1/10) of the applicable limit.

(i) If the gross beta particle activity minus the naturally occurring potassium-40 beta particle activity at a sampling point has a running annual average (computed quarterly) less than or equal to 50 pCi/L (screening level), the Executive Secretary may reduce the frequency of monitoring at that sampling point to once every 3 years. Systems shall collect all samples required in paragraph (2)(a) of this section during the reduced monitoring period.

(ii) For systems in the vicinity of a nuclear facility, the Executive Secretary may allow the CWS to utilize environmental surveillance data collected by the nuclear facility in lieu of monitoring at the system's entry point(s), where the Executive Secretary determines if such data is applicable to a particular water system. In the event that there is a release from a nuclear facility, systems which are using surveillance data shall begin monitoring at the community water system's entry point(s) in accordance with paragraph (2)(a) of this section.

(b) Community water systems (both surface and ground water) designated by the Executive Secretary as utilizing waters contaminated by effluents from nuclear facilities shall sample for beta particle and photon radioactivity. Systems shall collect quarterly samples for beta emitters and iodine-131 and annual samples for tritium and strontium-90 at each entry point to the distribution system (hereafter called a sampling point), beginning within one quarter after being notified by the Executive Secretary. Systems already designated by the Executive Secretary as systems using waters contaminated by effluents from nuclear facilities shall continue to sample until the Executive Secretary reviews and either reaffirms or removes the designation.

(i) Quarterly monitoring for gross beta particle activity shall be based on the analysis of monthly samples or the analysis of a composite of three monthly samples. The former is recommended.

(ii) For iodine-131, a composite of five consecutive daily samples shall be analyzed once each quarter. As ordered by the Executive Secretary,

more frequent monitoring shall be conducted when iodine-131 is identified in the finished water.

(iii) Annual monitoring for strontium-90 and tritium shall be conducted by means of the analysis of a composite of four consecutive quarterly samples or analysis of four quarterly samples. The latter procedure is recommended.

(iv) If the gross beta particle activity beta minus the naturally occurring potassium-40 beta particle activity at a sampling point has a running annual average (computed quarterly) less than or equal to 15 pCi/L, the Executive Secretary may reduce the frequency of monitoring at that sampling point to every 3 years. Systems shall collect all samples required in paragraph (2)(b) of this section during the reduced monitoring period.

(v) For systems in the vicinity of a nuclear facility, the Executive Secretary may allow the CWS to utilize environmental surveillance data collected by the nuclear facility in lieu of monitoring at the system's entry point(s), where the Executive Secretary determines if such data is applicable to a particular water system. In the event that there is a release from a nuclear facility, systems which are using surveillance data shall begin monitoring at the community water system's entry point(s) in accordance with paragraph (2)(b) of this section.

(c) Community water systems designated by the Executive Secretary to monitor for beta particle and photon radioactivity can not apply to the Executive Secretary for a waiver from the monitoring frequencies specified in paragraph (2)(a) or (2)(b) of this section.

(d) Community water systems may analyze for naturally occurring potassium-40 beta particle activity from the same or equivalent sample used for the gross beta particle activity analysis. Systems are allowed to subtract the potassium-40 beta particle activity value from the total gross beta particle activity value to determine if the screening level is exceeded. The potassium-40 beta particle activity shall be calculated by multiplying elemental potassium concentrations (in mg/L) by a factor of 0.82.

(e) If the gross beta particle activity minus the naturally occurring potassium-40 beta particle activity exceeds the screening level, an analysis of the sample shall be performed to identify the major radioactive constituents present in the sample and the appropriate doses shall be calculated and summed to determine compliance with R309-200-5(4)(d)(i), using the formula in R309-200-5(4)(d)(ii). Doses shall also be calculated and combined for measured levels of tritium and strontium to determine compliance.

(f) Systems shall monitor monthly at the sampling point(s) which exceed the maximum contaminant level in R309-200-5(4)(d) beginning the month after the exceedance occurs. Systems shall continue monthly monitoring until the system has established, by a rolling average of 3 monthly samples, that the MCL is being met. Systems who establish that the MCL is being met shall return to quarterly monitoring until they meet the requirements set forth in paragraph (2)(a)(ii) or (2)(b)(i) of this section.

(3) General monitoring and compliance requirements for radionuclides.

(a) The Executive Secretary may require more frequent monitoring than specified in paragraphs (1) and (2) of this section, or may require confirmation samples at its discretion. The results of the initial and confirmation samples will be averaged for use in compliance determinations.

(b) Each public water system shall monitor at the time designated by the Executive Secretary during each compliance period.

(c) Compliance: Compliance with R309-200-5(4) (b) through (e) will be determined based on the analytical result(s) obtained at each sampling point. If one sampling point is in violation of an MCL, the system is in violation of the MCL.

(i) For systems monitoring more than once per year, compliance with the MCL is determined by a running annual average at each sampling point. If the average of any sampling point is greater than the MCL, then the system is out of compliance with the MCL.

(ii) For systems monitoring more than once per year, if any sample result will cause the running average to exceed the MCL at any sample point, the system is out of compliance with the MCL immediately.

(iii) Systems shall include all samples taken and analyzed under the provisions of this section in determining compliance, even if that number is greater than the minimum required.

(iv) If a system does not collect all required samples when compliance is based on a running annual average of quarterly samples, compliance will be based on the running average of the samples collected.

(v) If a sample result is less than the detection limit, zero will be used to calculate the annual average, unless a gross alpha particle activity is being used in lieu of radium-226 and/or uranium. If the gross alpha particle

activity result is less than detection, 1/2 the detection limit will be used to calculate the annual average.

(d) The Executive Secretary has the discretion to delete results of obvious sampling or analytic errors.

(e) If the MCL for radioactivity set forth in R309-200-5(4)(b) through (e) is exceeded, the operator of a community water system shall give notice to the Executive Secretary pursuant to R309-105-16 and to the public as required by R309-220.

(f) To judge compliance with the maximum contaminant levels listed in R309-200-5(4), averages of data shall be used and shall be rounded to the same number of significant figures as the maximum contaminant level for the substance in question.

R309-205-8. Turbidity.

(1) Routine Monitoring Requirements for Public Water Systems utilizing Ground Water Sources

The frequency of required turbidity monitoring or the lack of any required monitoring listed below may be increased or changed by the Executive Secretary. Monitoring and reporting of water characteristics such as turbidity, conductivity, pH, and temperature of ground water sources and nearby surface water sources may be required so as to provide sufficient information on water characteristics so that the Executive Secretary may classify existing ground water sources as required by R309-505-7(1)(a)(i)(A).

(a) All community water systems shall monitor ground water sources for turbidity once every three years.

(b) Non-transient non-community water systems are not required to monitor ground water sources for turbidity unless so ordered by the Executive Secretary.

(c) Transient non-community water systems are not required to monitor ground water sources for turbidity unless so ordered by the Executive Secretary.

(d) Samples may be taken from a representative location in the distribution system. However, the Executive Secretary may require that samples be collected from each individual source.

(2) Procedures if Ground Water Source Turbidity Limit is Exceeded

If the result of an analysis of water from a ground water source or combination of ground water sources indicates that the turbidity limit of 5 NTUs is exceeded, the system shall collect three additional analyses at the same sampling point within one month. When the average of these four analyses (rounded to the same number of significant figures as the limit) exceeds the maximum turbidity limit, the system shall give public notice as required in R309-220. Where the raw water turbidity of developed spring or well water is in excess of 5 NTU, as measured by the average of the four samples, the spring or well is subject to re-classification by the Executive Secretary and it may be necessary that the raw water receive complete treatment as described in R309-525 or R309-530 of these rules or its equivalent as approved by the Executive Secretary. Monitoring after public notification shall be at a frequency and duration designated by the Executive Secretary.

(3) Turbidity monitoring requirements for surface water and ground water sources under the direct influence of surface water. . .

. . . are specified in R309-215-9.

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